



### Presidential Address

# The ASHRAE Promise: A Sustainable Future

By **Terry E. Townsend, P.E.**, 2006–2007 ASHRAE President

I would like to welcome you to the dawn of a new era of ASHRAE. We, the members of ASHRAE, are entering a time of great opportunities such that we have never seen before in our history. The problems that we are faced with, the opportunities that we have to provide solutions to, not only in North America but globally, are astounding.

We also have approved some directions to help us achieve those solutions. For the first time in the history of ASHRAE, we have a research strategic plan. Approved under the direction of Presidential Member Ron Vallort, P.E., the plan gives us a framework and gives guidance to the technical committees that they've never had before. Under the direction of Presidential Member Lee Burgett, P.E., we approved a sustainability roadmap. And again, we have direction on where we need to go and what we need to do

#### **About the President**

Terry E. Townsend, P.E., Fellow ASHRAE, is president, Townsend Engineering Inc., Chattanooga, Tenn., and Panama City, Fla. Townsend has served as president-elect, treasurer, vice president, and Region VII director and regional chair.

He serves on Technical Committee (TC) 2.7, Seismic and Wind Restraint Design; TC 2.8, Building Environmental Impacts and Sustainability; TC 7.1, Integrated Building Design; TC 6.6, Service Water Heating; TC 6.9, Thermal Storage; and TC 9.6, Healthcare Facilities. His past service also includes chair of Publishing

Council, Technology Council, President-Elect Advisory Committee (PEAC), Members Council and the Advocacy Committee.

He was the ASHRAE representative to the ASHRAE/U.S. Green Building Council Steering Committee and ASHRAE liaison to both the American Society for Healthcare Engineering and the National Environmental Balancing Bureau. He held all offices in the Tennessee Valley Chapter.

He is the recipient of the Exceptional Service Award, the Distinguished Service Award, a Region VII Technology Award, a Regional Award of Merit and a Chapter Report Award.

to be a greater influence in the aspect of sustainability. Also, we have approved an ASHRAE strategic plan, which provides four directions on activities that further focus and redirect our efforts in this time of tremendous opportunity.

A common thread runs through all of these documents—the concept of sustainability. Sustainability means a lot of things to a lot of people. One definition included in ASHRAE documents is that “sustainability is the concept of maximizing the effective use of our resources while minimizing the impact of those resources on the earth and its environment.”

The United Nations Committee of the Environment and Development developed a definition that has been widely used—“sustainability meets the needs of the present without compromising the ability of future generations to be able to meet their needs.”

My favorite definition is “that in order to have a sustainable environment and a sustainable situation, we have to have an equilibrium that exists between human society and stable ecosystems.”

Why are we worried about sustainability? Because we are in a crisis. This crisis began as an energy crisis that never really went away. It has blossomed into a global crisis, a crisis of a magnitude that only ASHRAE can address.

According to the Chinese, the word “crisis” is made up of two symbols. The first symbol is danger, and truly we are faced with danger. In terms of energy, we are endangering ourselves—every six months we use up resources that it took the earth more than 50,000 years to make.

Over the last three years, we have lost a mass of ice at the North Pole equal to the size of Texas, New York and Maine combined. In Panama City, Fla., fishermen tell me that the Gulf of Mexico is warmer this summer than in the last 50 years, with a negative impact on their fishing. Normally, the temperature in the Gulf is around 62°F (17°C). In the last few days, it has risen to 75°F (24°C). Plant and animal species are disappearing at a rate that rivals the rate of extinction of species when dinosaurs disappeared.

What in the world are we doing to ourselves? What are we doing to ourselves to allow this to happen? One thing I do know is that extinction is forever.

The second Chinese symbol for crisis is opportunity. During the energy crisis of the 1970s, ASHRAE rose to the opportunity. We developed our energy conservation standard, Standard 90.1, in direct response to a government request.

We have a new opportunity before us, and we must rise to the occasion. We must step forward in a bold and effective manner to provide a sustainable future. Because of that challenge, there is a new spirit of the age that is elec-

tric with possibilities, opportunities and invention that is permeating ASHRAE.

We are the ones who are challenged to properly organize ourselves and pull ourselves up by our boot straps. We are about to go where no other organization has dared to go. And, you know, we are going to get there because we have something that no one else has—you, our membership, our grassroots and the greatest technical resource on earth.

We must have a sense of collective purpose. We are the pioneers in the reawakening of our Society. We are on duty, and we are responsible for achieving a sustainable future.

It has been said that to turn the concept of sustainability into a program that can be implemented, numerical goals and timelines must be set. So I am issuing challenges and assignments to ASHRAE councils and ad hoc committees. You can find these on ASHRAE.org.

First, let me address the *Advanced Energy Design Guide*

series called to action under the leadership of Presidential Member Don Collier Ph.D., P.E. The series is designed to provide 30%, 50% and 70% guidance beyond existing building codes.

We have been focused on new construction, which represents just 2% of the building stock in our country. We must broaden our focus to include existing buildings, which accounts for the other 98%.

We must accelerate the completion dates to ensure that by 2010 we are done with the 50% guides. Why? Because the American Institute of Architects has given us a challenge. They have laid down the gauntlet and said, “By 2010 we are going to be able to provide 50% guidance. And, ASHRAE, we need your help.” So, we are going to help.

Finally, we also are going to increase the scope to include high-rise residential

buildings, which is one of the fastest growing segments of building stock.

Another challenge relates to building metrics. You can take three engineers and have them look at any facility, and I guarantee you would have five opinions about how well a building performs relative to energy, water consumption, indoor air quality and comfort.

We must develop metrics to produce results that are repeatable, verifiable and that can be used anywhere on this planet. At the same time, we must include in these metrics the development of what I call a “carbon equivalent basis” for building construction and operation.

A lot of groups are saying that such-and-such building is sustainable. But, really, it is not. However, if you look at a carbon equivalent basis for the construction of a building as



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well as its operation, you get a true measure of whether the building is sustainable.

You may say, "Oh, I am not worried about that. I don't do anything that produces carbon dioxide, so you're not talking about me." For every 10,000 miles (16 000 km) that you drive a vehicle, you produce the weight of that vehicle in carbon dioxide emissions.

Every ton (0.9 Mg) of black coal used in a power plant to meet your needs produces 4 tons (3.6 Mg) of CO<sub>2</sub> emissions. In 1992, a United Nations committee determined that if we achieve 2.2 lbs (1 kg) of carbon per person per day, we will stabilize the CO<sub>2</sub> accumulating in the atmosphere. Right now we are at approximately 385 parts per million. Before the industrial revolution, we were at 250 parts per million.

As a result, according to the National Center for Climatic Research, man is becoming a weather maker. We are influencing the rate of change of the weather and the climate at six times the normal rate, based upon past cycles. I agree the earth has cycles, but we are having an adverse effect on these cycles at a rate of six times the normal rate.

In the United States, we produce per capita, 14.6 lbs (6.6 kg) of carbon per person per day. Switzerland, which is considered a very green economy, produces 4.4 lbs (2 kg) of carbon per person per day.

So we have a ways to go. Our challenge is not to reduce the lifestyle that we have become accustomed to, but to reduce this carbon emission effectively, economically and in a way that we will tolerate because we are not very tolerant people as you well know.

The cornerstone of ASHRAE in the past and our bragging rights has been the development of Standard 90.1 in the original energy crisis. It is my understanding that our existing 90.1 standards project committee is struggling to achieve between 5% and 7% increase in stringency over the 2004 version.

Our membership has spoken, and they say, "That is not acceptable." The people of North America are telling me, through personal conversations as well as dealing with our legislative leaders, "ASHRAE, we are beginning to lose confidence in you. We do not think that you can give us what we need in a

timely manner." Outside the United States, people are looking at us and saying, "ASHRAE, you didn't deliver again, did you?"

These expressions have got to stop, and they must stop *right now*. We are going to increase the stringency of Standard 90.1 in the 2010 version so it is 30% more stringent than the 2004 version.

This will not be a matter of "if we do it." It will be a matter of "we will do it." There will not be another option. We will achieve this. We will have the leadership, and we will ensure we have people on this committee who are determined enough to give us this guidance.

I also have been told that Standard 90.1 is too difficult to use, that "it takes a Ph.D. to use that thing, and even they are having trouble." To meet this challenge, I propose we use focus groups made up of representatives of the target audience. Using focus groups was very successful in development of the *Advanced Energy Design Guide* series. They can tell us what type of information we need to provide and in what format.

We also must continue to streamline the standards development process. Right now, we have an opinion that to achieve consensus we must achieve nearly unanimous agreement. I don't understand that. Why are we requiring a greater level of stringency for acceptance of a standard than required to change the Constitution of the United States? Does this make sense? I agree that maybe we ought to be stringent, but not to the extent we have now.

Also in conjunction with our existing prescriptive Standard 90.1, the international market has called for additional guidance. So we are going to create a performance-based Standard 90.1 with the same level of stringency as the prescriptive base. We should be prepared to complete this performance-based Standard 90.1 by 2010.

Another challenge we face is water conservation. Water is the ultimate renewal resource and source for life. Right now across the world, water is disappearing at an alarming rate. In fact, the sixth largest lake on the face of the earth is literally gone. We will develop a consensus-based water conservation

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You see, we are the leaders that the world has been waiting on. We don't need to hide that fact. We are the innovators and entrepreneurs that the world has been seeking. We can achieve our goals together if we work together because we are able to clearly see the need for a sustainable future.

standard in collaboration with the U.S. Green Building Council, the American Society of Plumbing Engineers and the American Water Works Association.

We must develop a baseline for indoor environmental quality. One of the claims about a sustainable building is that, "Ah, a sustainable building makes your indoor environmental quality so much better." Does it? We must produce a baseline to give researchers and others, so they can determine if indoor environmental quality is better in so-called sustainable buildings.

I have formed a new ad hoc committee, ASHRAE Vision 20/20, which will look at all the products and research we are developing. We want to make sure our products do not become obsolete. Also, they will help ensure that we achieve net zero energy guidance for all building types by 2020. And, they will help us explain to our members and the public why we are doing this, how we are doing it and when we are going to do it.

The second ad hoc committee that I have formed is called GAME, which stands for Greening ASHRAE Meetings and Expositions. It will give guidance to chapters, regions and the Society at large on how we can minimize the impact of our meetings on natural resources.

Other resources we plan to provide include a Green Speaker's Bureau and an expanded Distinguished Lecturer's Program to include more topics on sustainability. We will go outside of ASHRAE and get the best people in the world to come and inspire you, because this is what we should be doing for our members. This is what you expect and deserve.

We want to increase the global outreach. Our Associate Society Alliance is made up of 47 organizations worldwide, with total individual membership of more than 500,000 engineers, designers, technicians and contractors. A lot of these organizations have strengths that can help us in our weak areas, and we have strengths that can help them in their weak areas. We must improve our collaborative effort to work together and provide much more sustained, consistent products, training, applications and guidance globally. Also, we will partner with organizations that pertain to sustainability.

This year, we undertook something that has never been done before in the history of ASHRAE, and that was become effective in advocacy. As chair of the Advocacy Committee, I

learned something that really shocked me. Outside the realm of ASHRAE, nobody knows us.

Legislators don't know us. The public does not know us. Why not? We have had this stoic attitude of "we have the answers, so they will come to us." That does not work. So now, we are going out and meeting people. We will be in the forefront, not in the background. We will be the ones that are promoting what you, the members, need. We will ensure that our voice is heard, that our technical expertise is integrated into the legal process that develops the laws that we are constrained to operate under.

We will be there for you, and we are not going to back down. They will know that we are the global engine of sustainability.

The one objective I have this year is to make our members more valuable to our industry. How will we do that? One way is through the development of certification programs by partnering with other organizations. Through our certification programs, we will meet the immediate needs of the owners, a ready market, because they will be integrally involved.

I have called for four certification programs to be developed. They are HVAC&R design for health-care facilities, partnering with the American Society for Healthcare Engineering and the American Hospital Association; Building Systems Operation and Management with the International Facility Management Association (IFMA), the Association of Higher Education Facilities Officers (APPA), and the Building Owners and Managers Association (BOMA); Building Systems Commissioning with the National Environmental Balancing Bureau, BOMA and the General Services Administration (GSA); and the Engineering for Sustainability Professional with the U.S. Green Building Council (USGBC) and GSA.

At the core of the Engineering for Sustainability Professional program will be the LEED® Accredited Professional (LEED-AP) program. However, we will build upon this core by including training in the *Advanced Energy Design Guide* along with how to properly evaluate the performance of buildings, including the carbon equivalent basis. Additional training will include ASHRAE fundamentals and the ASHRAE standards on energy, indoor air quality and thermal comfort. We will provide what the owners say they have must have right now. Who will promote these programs for us? The owners, who

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will be involved in the overall certification program development process from the beginning.

We will need to expand the scope and focus of our membership. Right now we are focused primarily upon engineers and designers along with contractors, equipment representatives, and equipment manufacturers. Because of the concept of sustainability, we must go outside of our current areas of membership and seek to include facility managers, owners and architects because they are also involved in the sustainable design process. ASHRAE has what they need. No other organization has the guidance on how we can effectively, in a timely manner, achieve a sustainable future.

You see, we are the leaders that the world has been waiting on. We don’t need to hide that fact. We are the innovators and entrepreneurs that the world has been seeking. We can achieve our goals together if we work together because we are able to clearly see the need for a sustainable future.

One of the wisest men I’ve ever known was my father. His mother was a Cherokee Indian—a member of the Eastern Band of the Cherokee Nation. The Cherokee were devoted and

appreciative of Mother Earth and Father Sky because that was the source of their life. That was the source of sustaining their life. They also had a very deep devotion to the family unit.

Before my father died he told me, “I want you to promise me that no matter where you go, no matter what you do or what you become, always take care of your family. That is your legacy and the most precious responsibility that will ever be bestowed upon you.”

Like me, you may have children and possibly grandchildren looking to you to provide them with a future that is filled with hope and opportunity and not fear and uncertainty. That is why I am asking you to join with me and let us work together as we have never worked before. Let us move forward together in a manner that is cohesive so that we can make good on the “ASHRAE Promise of a Sustainable Future.”

Everything I have discussed here represents “just the beginning.” Because much of the work was begun before Quebec City and the balance of activities have been initiated since the 2006 Annual Meeting on the various challenges and assignments that have been made, it makes me proud to say that ASHRAE is finally “Walking the Talk.”◆